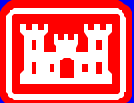


Urban Growth

- Atlanta, GA 'Boom Town'
 - 1990's - fastest growing human settlement in history
 - land area larger than the state of Delaware
 - nation's longest average commute times
 - 69 'ozone alert' days in 1999
 - stopped highway construction until air quality issue is resolved
- Defines 'sprawl'
 - the unstoppable spread of development
 - threatens sensitive wildlife and wetland habitat
 - half of all Florida wetlands - lost
 - 90% of California coastal ecosystems - lost
 - huge Environmental impacts
- How does this impact Military Facilities?
- How do we get a handle on the problem?

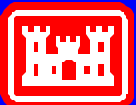


Urbanization Pressures on Military Lands

Brian Deal

U.S. Army Engineer Research and Development Center (USAERDC)

U.S. Army Construction Engineering Research Lab (USACERL)

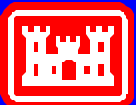
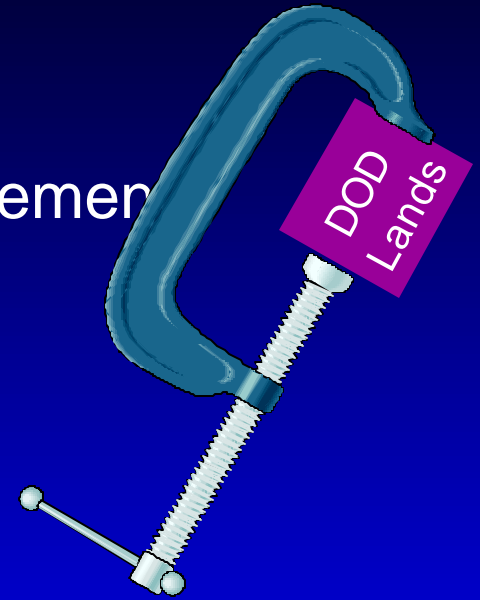


US Army Corps of Engineers

Engineer Research & Development Center

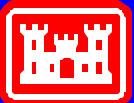
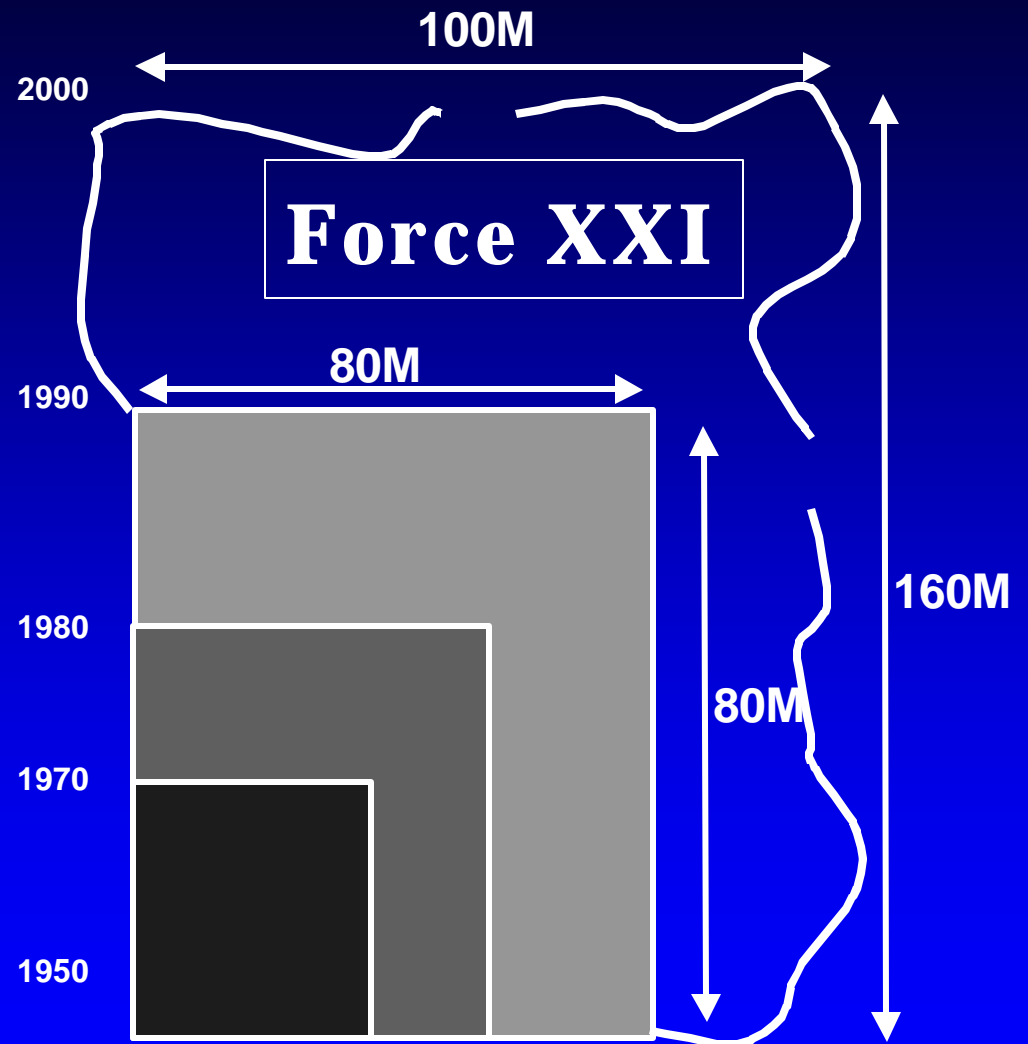
DOD Landuse Challenges

- Maintain Mission Capability
- Accommodate Changing Landuse Requirements
 - training area requirements
 - new weapons and tactics
- Accommodate mission in a smaller area
 - fewer bases
 - BRAC
 - land acquisition (to enlarge bases) seldom an option
- Increasing Land Use Constraints Due to
 - resource protection (inside the fence line)
 - encroachment (outside the fence line)



Changing Landuse Requirements

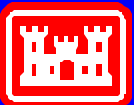
the changing landuse requirements (in meters) needed to house and train one modern soldier (Kingston 1999)



Historic Army Land Acquisition Patterns

significant military lands expansions seem closely tied to major military conflicts and many recent expansion initiatives have been met with local opposition

Time	Context	Land Holdings
Before 1917	Pre WW I	Few major posts; many small frontier bases; episodic unit training
Late teens	WW I	Major acquisitions of new land
1920s & 30s	Inter-war period	Most WWI acquisitions retained; some returned to state adjutants general; no new acquisitions
1940s	WW II	Major round of new acquisitions Most WWI bases expanded
1950s	Post WW II Korean War Start of Cold War	Existing bases retained Expansions for use of advanced weaponry Begin Cold War acquisitions/expansions Extensive public domain withdrawals OCONUS buildup
1960s & 70s	Cold War Vietnam War	Continued land expansion Cold War acquisitions Some local opposition to expansion
1970s & 80s	Late Cold War	Few expansions/acquisitions Local opposition becomes successful
1990s plus	Post Cold War Peace keeping missions	Base closures (4 rounds)-consolidations Expansion/acquisition opposed Public domain permits require EIS studies Power projection from CONUS



Increasing Land Use Constraints

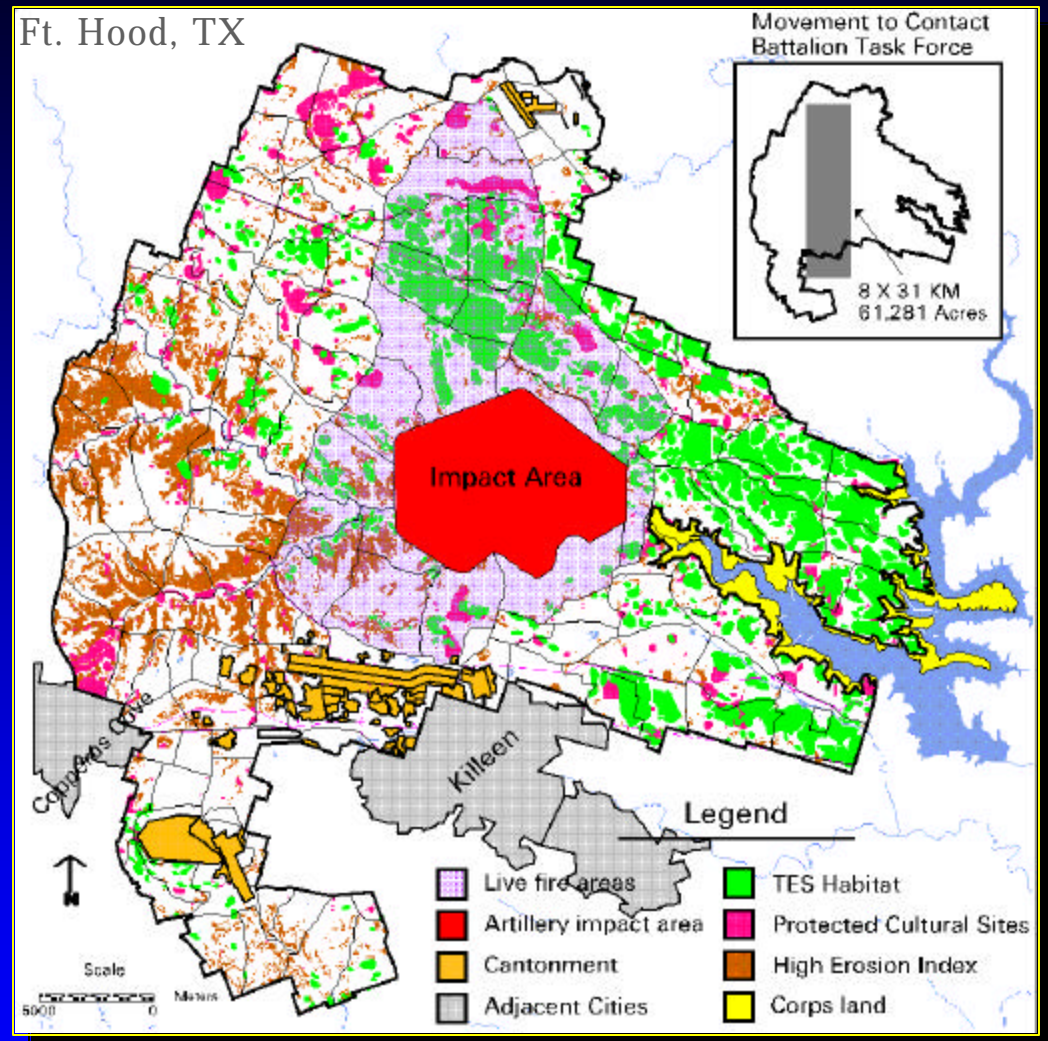
inside the fence line

Mission

- Constrained Access to Lands
- Limits on Use of Ranges
- Inability to Train to Doctrine
- Increased Equipment Damage

Stewardship

- Protect Sensitive Resources
- Cumulative Impacts and NEPA
- Integrated Land Use Management

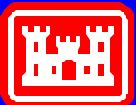


Area Constrained

- 21% - protected species
- 13% - erosion from training
- 6% - archeological sites

Combined Total

32% of area totally or partially constrained for use

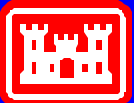


Urban Dynamics

outside the fence line

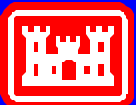
- From 1970 to 1990, 19 million acres of once-rural land in the U.S. Became urbanized
 - in 1920 - 50% of the US population lived in cities
 - in 1960 - 70%
 - today the US is about 80% urban
- From 1970 to 1990, the density of urban population in the United States decreased by 23 percent
 - more than 50% of the population now live in suburbs
- From 1969 to 1989, the Population of the U.S. Increased by 22.5%
 - the Number of Miles Driven by that Population Increased by 98.4 Percent
- From 1983 to 1987, the Population of the U.S. Increased by 9.2 Million
 - the Number of Cars and Trucks Increased by 20.1 Million

**Between 1970 and 1990: New York's population grew 5% and land area 61%
Chicago's population grew 4% and land area 46%
Cleveland's population declined 11% but land area grew 33%**

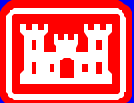
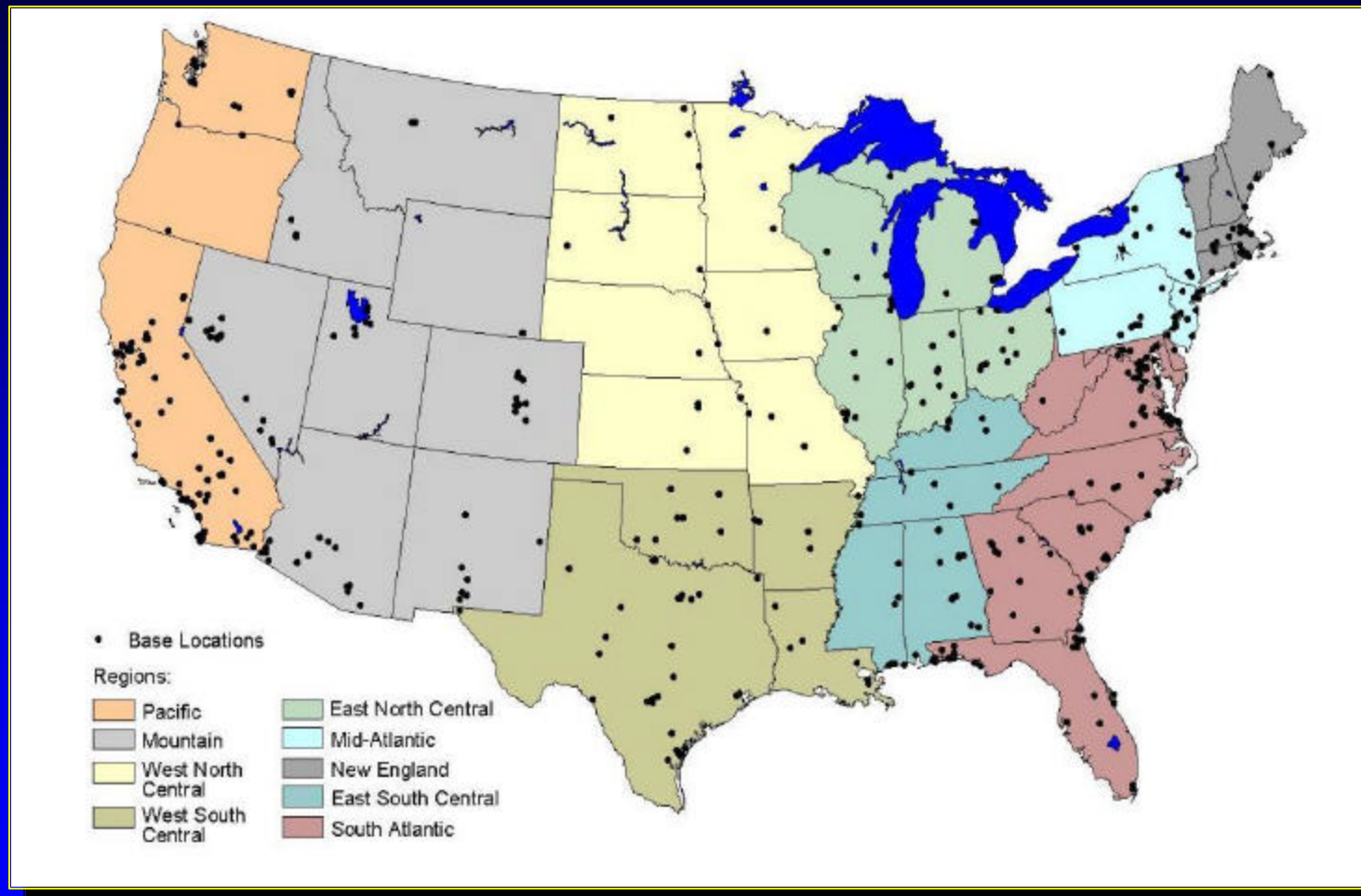


Growing Pains

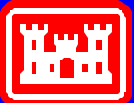
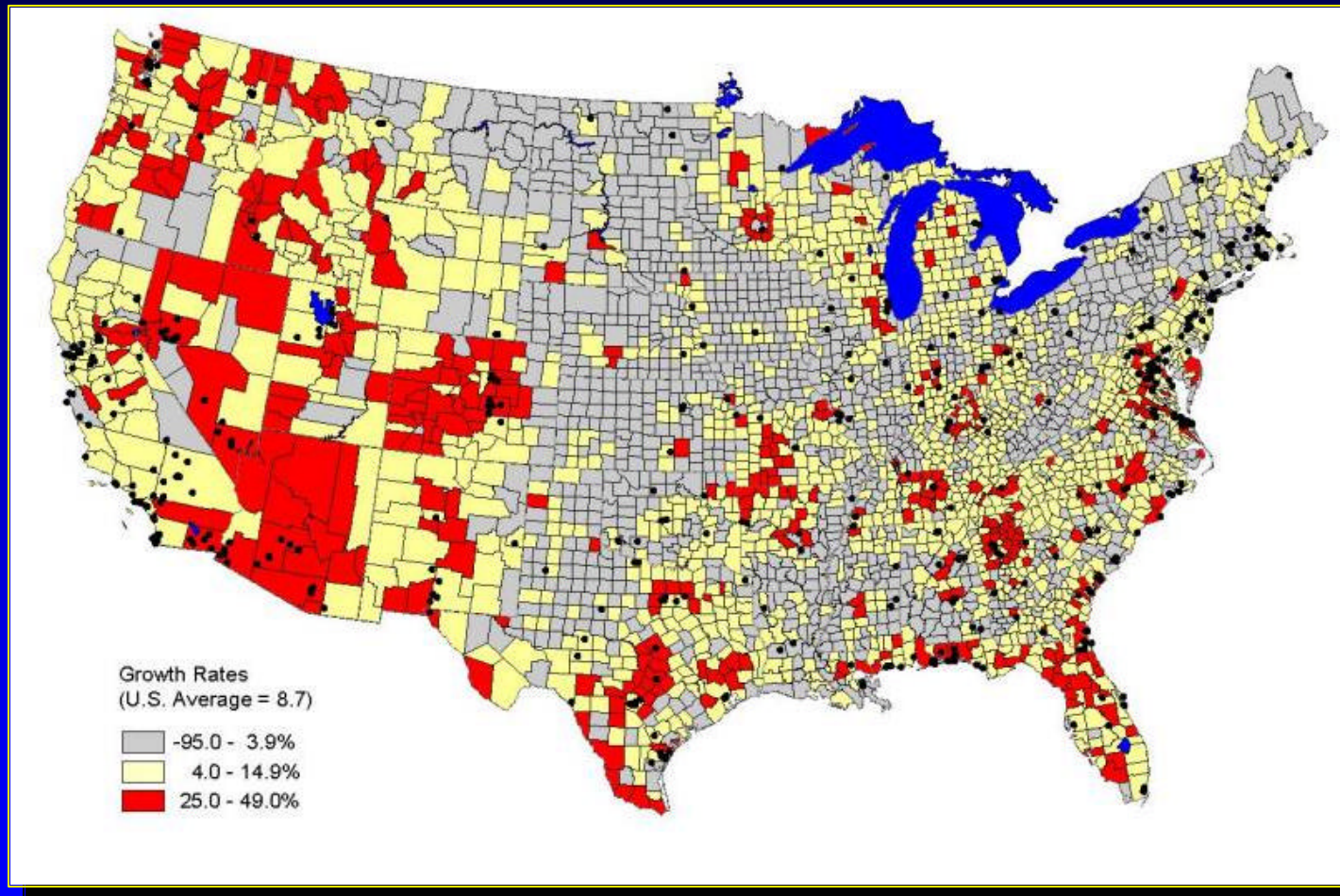
- As competition for land has intensified, so has disagreement over how to balance economic use and conservation of natural resources
- Controversy has focused on private property rights and the appropriate role of government in managing land
- The lack of a genuine dialogue between advocates of public and private interests has led to a paralysis of effective decision making at every level of government



Installation Locations by Region

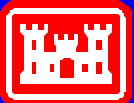


County Population Growth Rates With DOD Installations

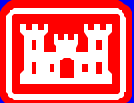
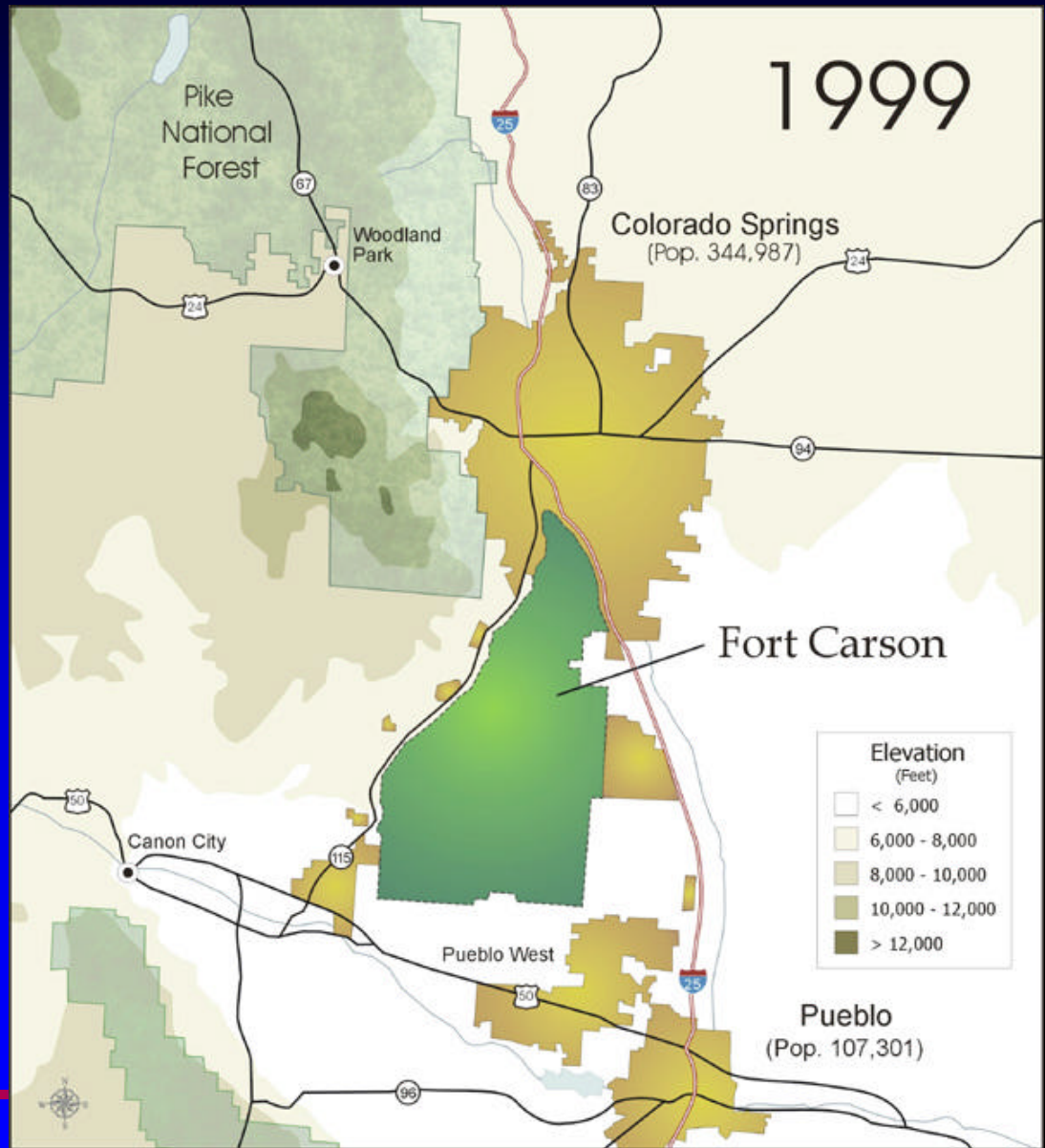


Affected DOD Installations

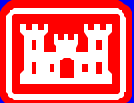
- Bases by Resident County Growth Rate
 - More than 15% 82 (18%)
 - Between 4 and 15% 236 (53%)
 - Less than 4% 130 (29%)
- Major Installations Falling into the High Growth Category Include:
 - Nellis AFB, Nye, NV/Clark, NV (county)
 - Luke AFB, Maricopa, AZ
 - Eglin AFB, Okaloosa, FL
 - Pacific Fleet Combat Training Center, Yuma, AZ
 - Fort Bliss, El Paso, TX/Dona Ana, NM
 - Fort Stewart, Bryan, GA
 - El Centro Naval Air Facility, Imperial, CA
 - Fort Hood, Coryell, TX
 - Fort Carson, El Paso, CO
 - Fort Bragg, Hoke, NC
 - Fort Campbell, Montgomery, TN
 - Fallon Naval Air Station, Churchill, NV
 - Yuma Proving Ground, Imperial, CA



Urban Growth at Fort Carson

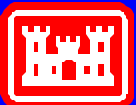


Camp Pendleton Urbanization

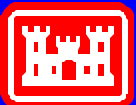
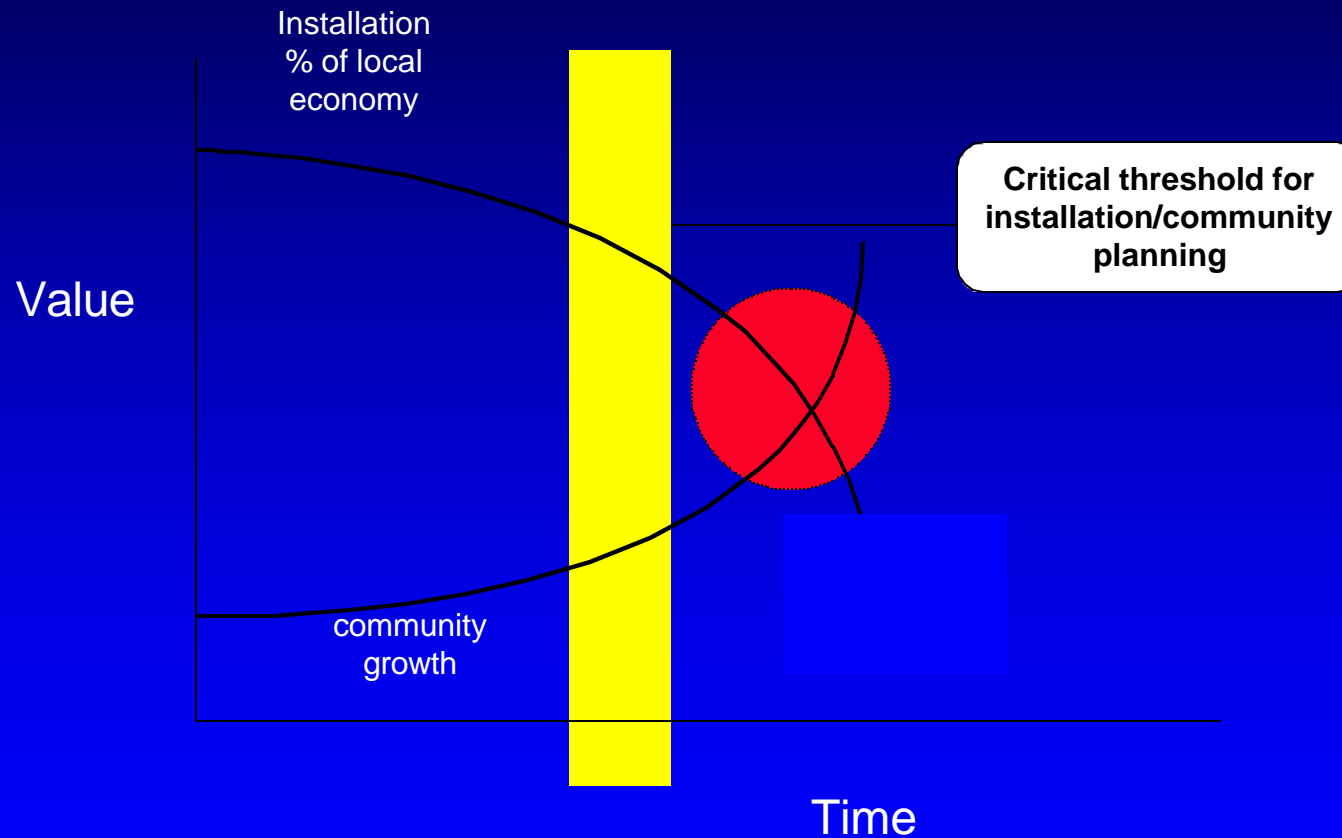


Installation Urbanization Impacts

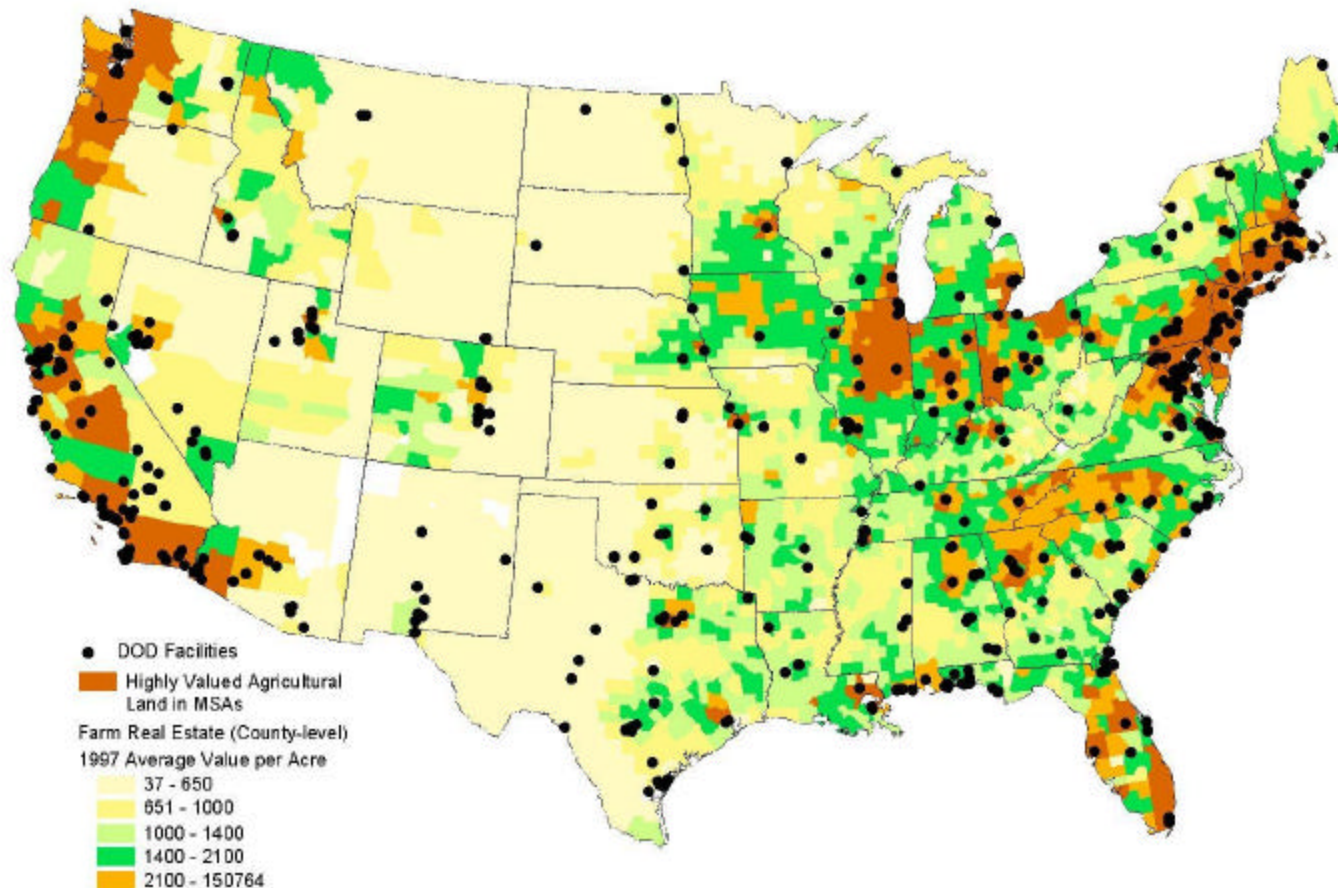
- Good Neighbor Issues
- Noise
- Dust and Air Quality
- Traffic
- Flooding
- Resource Competition
- Water
- Airspace
- Transportation Corridors
- Energy
- Stewardship
- Air Compliance
- Ecosystem Management
- Sensitive Resources
- Watersheds and Water Quality



Economic Interactions



Economic Indicators



Implication: agricultural land is highly valued, and there is competition for available land for development.

counties with consistently high RE value per acre for 97/87/78 (in the top 20% for all three periods) that are in MSA (metropolitan statistical areas)

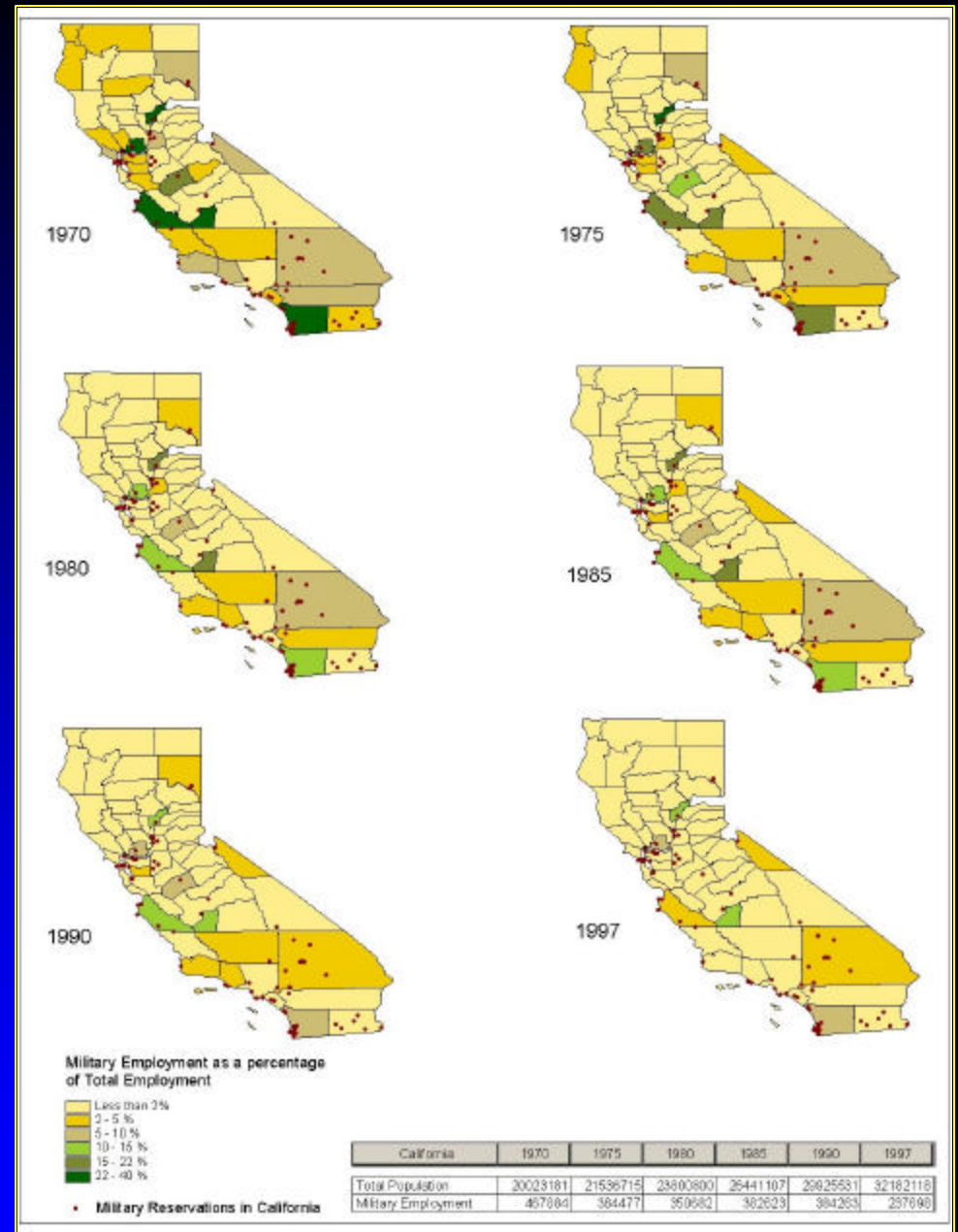
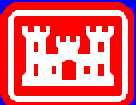
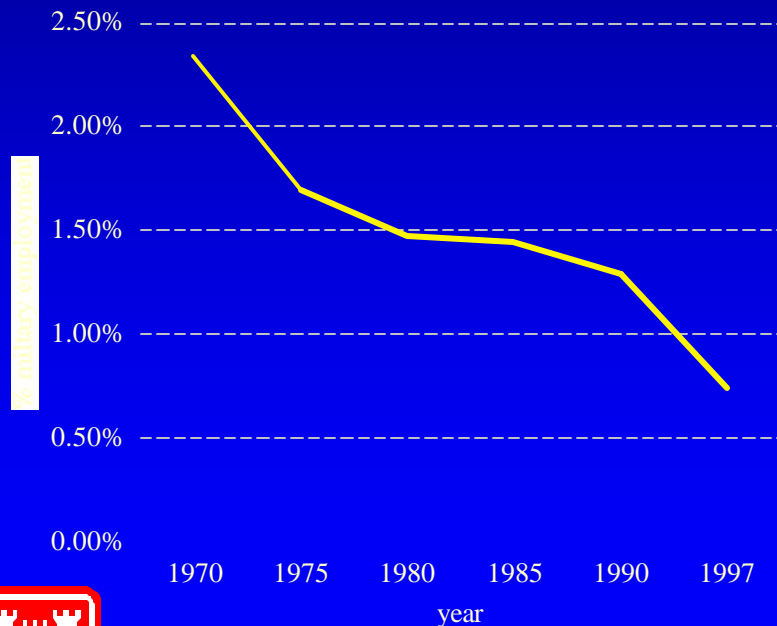
203 of the 516 facilities including:

Edwards AFB, Camp Pendleton, El Centro Naval Air Facility, Aberdeen Proving Ground, Andrews AFB, Fort Belvoir, Fort Eustis, MC Combat Command-Quantico, Fort Bragg (NC), Fort Lewis; McChord AFB

& Development Center

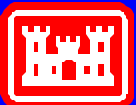
Military Employment in California

Military employment as a percentage of total employment



Public and Private Initiatives

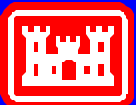
- The California legislature recently passed the *California Defense Retention and Conversion Act of 1999*.
 - One of the goals of the act is “the long-term protection of lands adjacent to military bases.”
 - Similar bills are being worked in other state legislatures.
- USA Today (in October 1999) featured *Military Bases Fight Suburban Sprawl*
 - discusses constraints on air flight activities at
 - Barry M. Goldwater Range in Arizona
 - Mountain Home Air Force Base in Idaho
 - Marine Corps bases in San Diego and the Mojave Desert
- Tacoma News Tribune (April 5, 2000) - *Land-Use Plan Said To Risk Future Of Area Bases*
 - Could rules in comprehensive plan cause Fort Lewis and McChord Air Force Base to close?

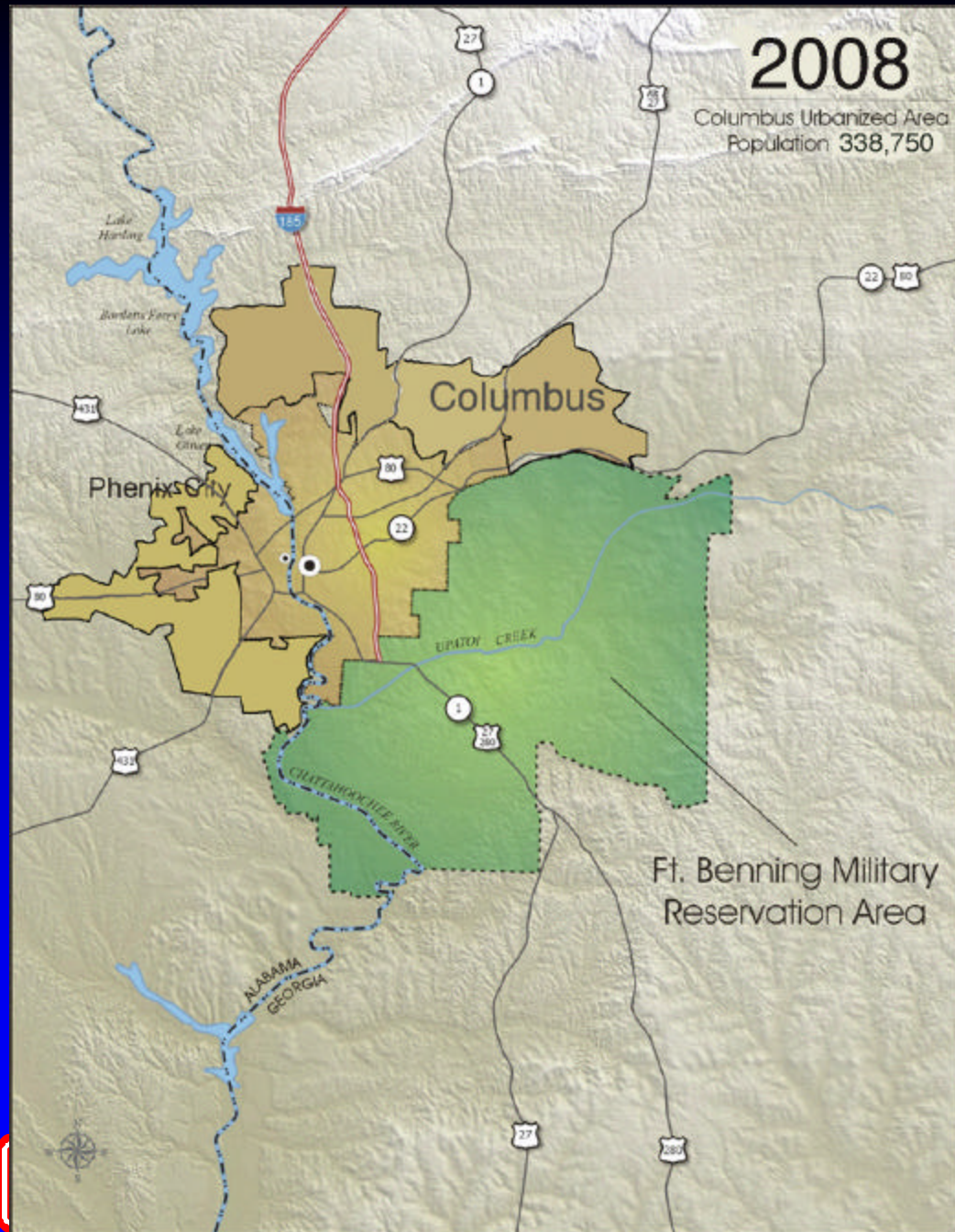


Recommendations

Military installations represent unique and difficult to replace assets. The rapid urbanization of areas in the vicinity of military installations is beginning to compromise the fundamental mission of some of our military installations and negatively impact the health, safety and welfare of both the public and private sector communities .

- Possible strategies for coping with this problem include:
 - Identifying and prioritizing installations at risk
 - Developing and nurturing more robust installation and community planning policies, procedures and forums
 - Developing a comprehensive understanding of the dynamics of urban change outside the installations (with the use of growth analysis models and alternative scenarios)
 - Understanding the future impacts associated with change scenarios - **sustainable indices**
 - Developing stock aggregation and spatial evaluation techniques to assess land use scenarios





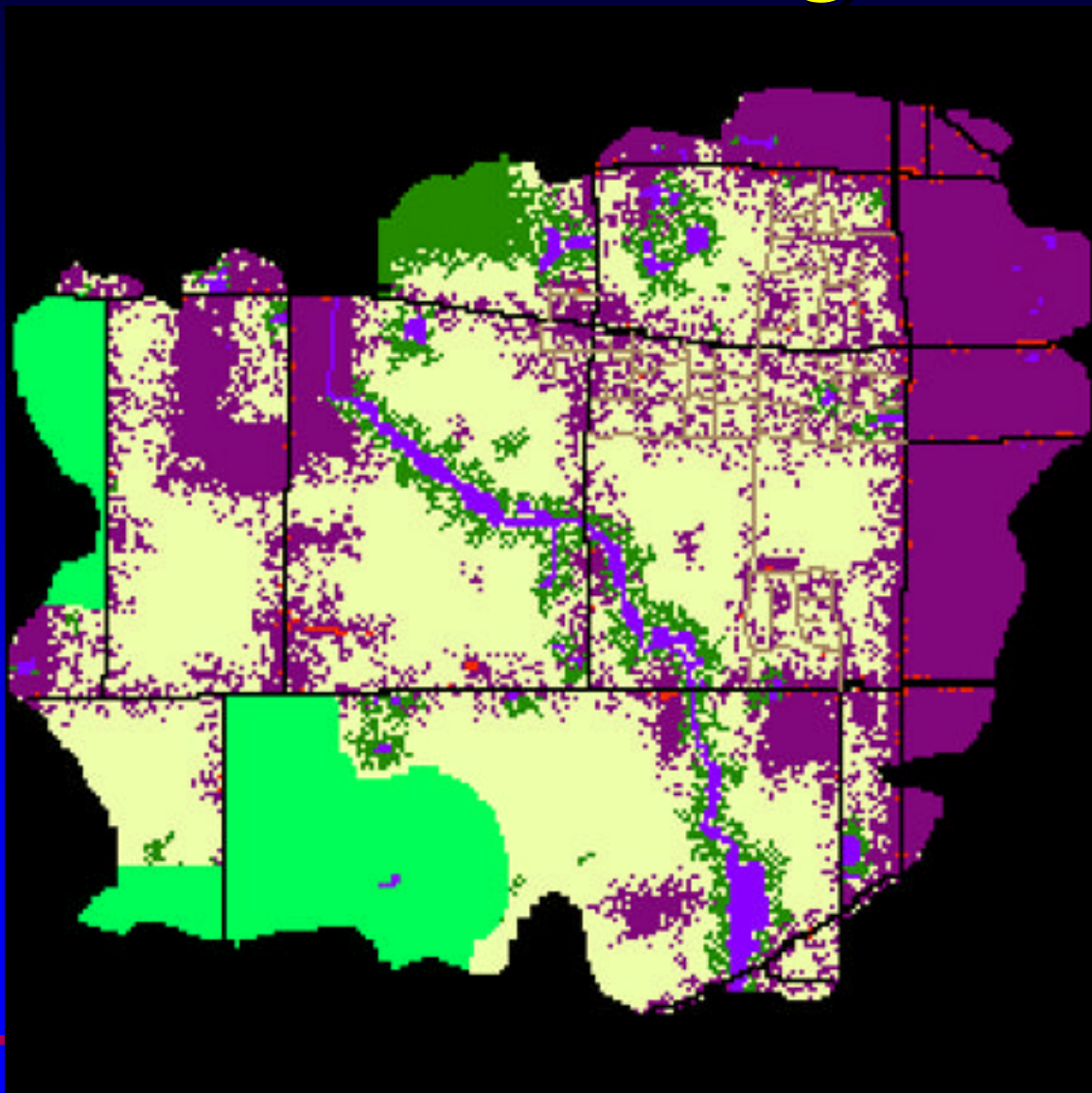
Ft Benning, GA

Dynamic Landuse Modeling

LEAM

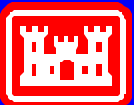
landuse evolution and
impact assessment model

understanding
the dynamics
of landuse
change



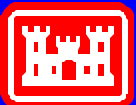
Land Use Assessment and impacts

- Water quality
 - The model also evaluates the influence of land use changes on surface water quality using land use imperviousness factors and average annual rainfall events. The output describes pollutant levels for nitrogen, phosphorus and suspended solids based on simple landuse characteristics and their associated multipliers.
- Water quantity
- Energy
 - associated externalities
- Habitat loss

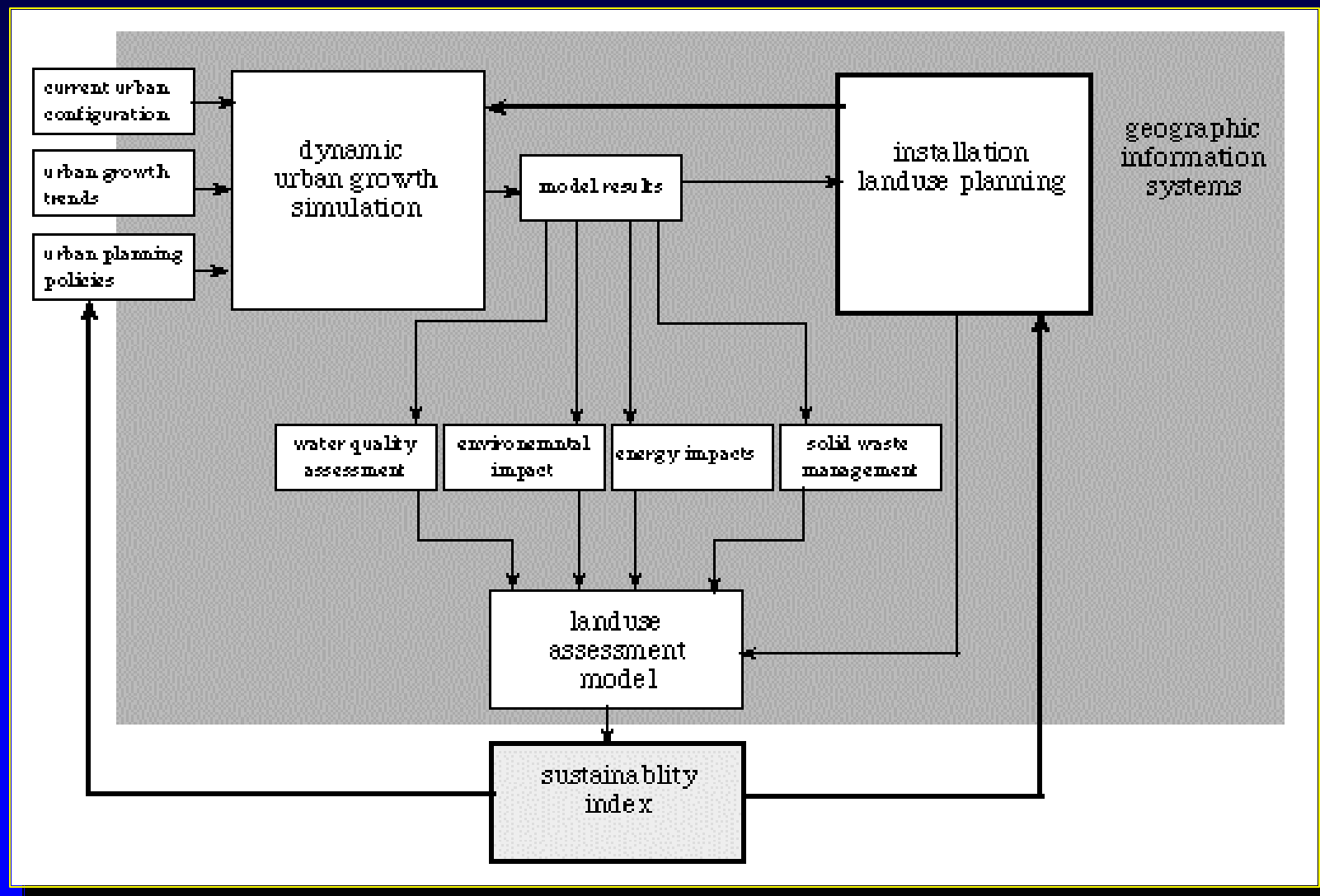


Sustainability Indices

- the development of regional sustainable indices as they relate to community interaction variables, climate change and urban risk assessments

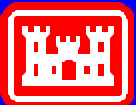


Process



Partners

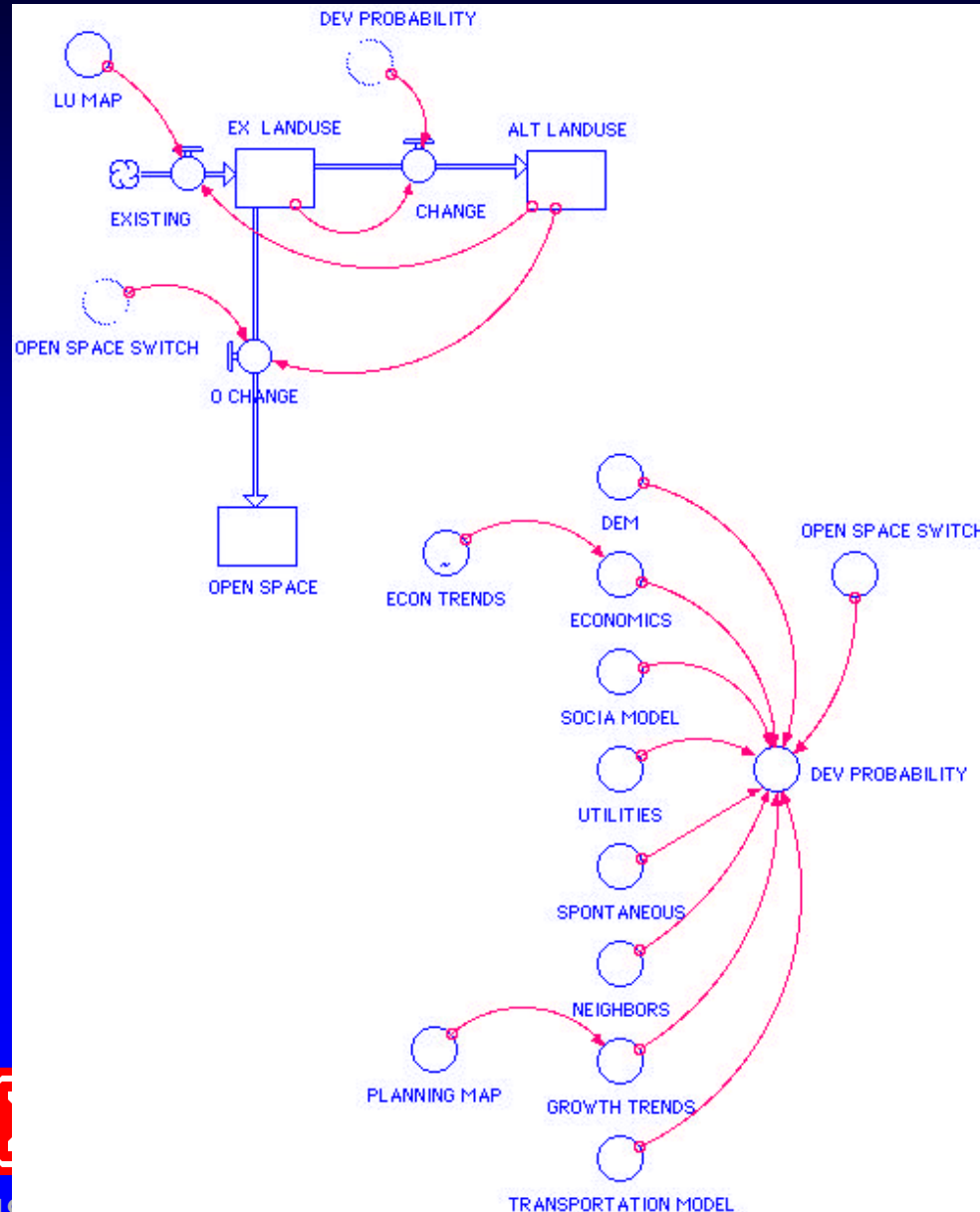
- CERL
 - TRIES
 - Texas Research Institute for Environmental Studies
- National Science Foundation
- University of Illinois
 - Urban and Regional Planning
 - Landscape Architecture
 - Building Research Council
 - NCSA
 - National Center for Super Computing Applications
- USGS



distributed model

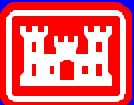
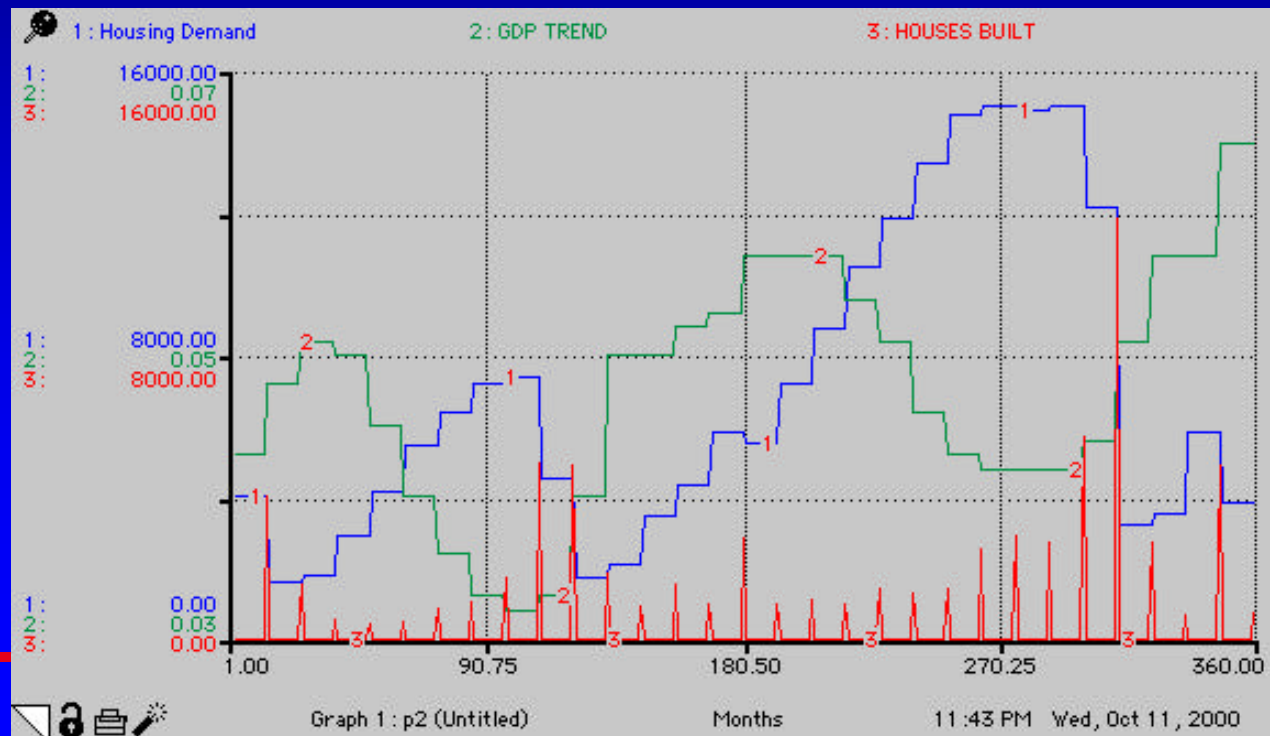
LEAM

- open space
- DEM
- economics
- social models
- utilities
- spontaneity
- organic
- growth trends
- transportation model

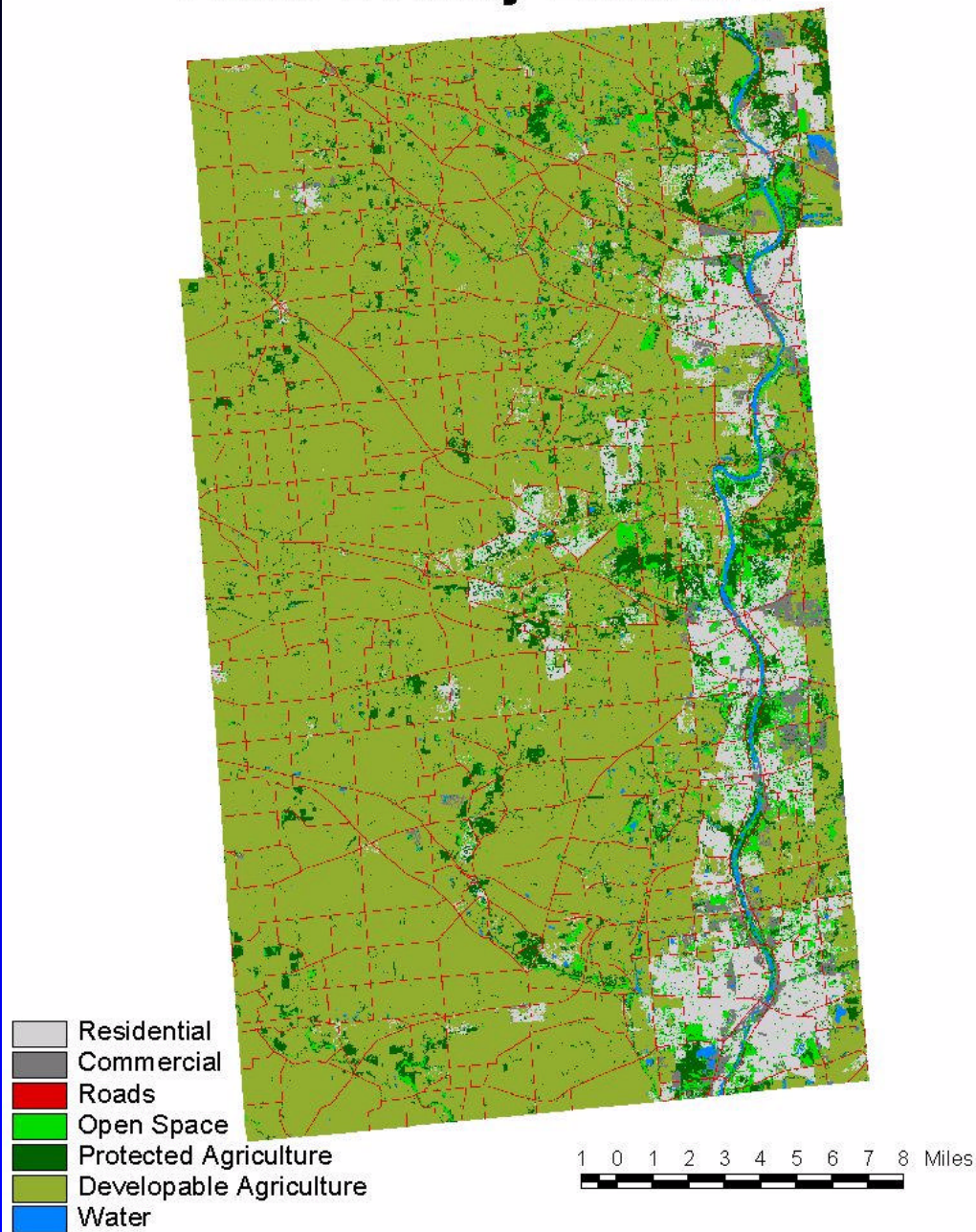


economics

- population growth is responsible for the housing demand
 - based on the statistical household-size predictions of Kane-County
- economic sector is the important factor that “decides” if the existing demand can be realized or if the particular budget constraint is too high
 - the demand for houses influences the average house price
 - rising over time in response to increased demand



Kane County Landuse



Kane County, Illinois

current model

QuickTime™ and a
Cinepak decompressor
are needed to see this picture.

